NOAA's National Weather Service
California-Nevada River Forecast Center

Operational Perspectives on HMT-West

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We're Struggling…

- The CNRFC is very much interested in leveraging and taking advantage of the investments and interest that the HMT project is making in our "back yard."
- Yet, we're having problems…
- The following slides offer insights into why this may be the case…

Operational Insights…

- RFCs are operational entities
  - Failure to deliver expected service is “not an option”
  - Reliability is more important than “cutting edge”
- RFC staff have a limited amount of time to generate operational forecasts
  - Complete forecast cycle (met + hydro) is < 3 hrs
  - Little or no time to experiment, especially during an event

Operational Insights…

- The NWS does not provide a complete end-to-end hydrologic forecasting system to RFCs
  - Significant local efforts to
    - Collect and process real-time data
    - Interact/collaborate with WM/FC/EM partners
    - Calibrate 100s of basins
    - Configure and maintain forecasting system(s)
    - Generate appropriate forecast products/services
  - We're busy keeping the our system going…

Operational Insights…

- The research community's recent emphasis on "operational application" has dramatically increased collaborative requests (demands)
  - Far in excess of RFC's capacity
  - Unwillingness to collaborate is frowned upon…
  - Often results in shallow and ineffective collaborations
    - Frustrating for researchers
    - Waste of RFC's time
    - Disappointing results for funding program

Operational Insights…

- What we need TODAY is different from what we'll need TOM0RROW to drive our hydrologic forecasting system
  - But we don't have TOMORROW's forecasting system to perform evaluations…
    - More than CHPS, it's new models and processes within CHPS
  - Need to align short and long term HMT R&D efforts with appropriate (today's / tomorrow's) forecasting environment

A Few More…

- Calibrated watershed model parameters are a function of:
  - Watershed characteristics
  - Data (precip, temperature, flows, etc.)
  - Calibrator skill and preferences
- "Improved or new" data must be consistent with the calibration…
  - "Climatology" of the operational system
  - "Climatology" of the new information

However…

- We recognize that if we're ever going to REALLY improve the way we do business, we must make some investments…
  - We just want to be smart about it…

CNRFC Assessment

- QPE
  - Gap filling RADARs in the Sierra are not practical
    - Amazing HMT effort. No other way to really learn this.
    - Unable to validate/dispute CNRFC process for distributing gage observations using PRISM normalization
  - High resolution gridded QPE isn't needed for CNRFC lumped watershed implementation
    - DMIP is another story, but we don't run DMs (today)
    - DM is a CNRFC goal, but not an immediate (< 5yrs) one
  - Additional precipitation gages always appreciated
  - Understand that you need confidence in QPE in order to improve QPF process

  - We still don't have an operationally functional multi-sensor precipitation estimation process/tool

CNRFC Assessment

- QPF
  - HMT mesoscale atmospheric models
    - Inadequate verification/performance information
    - HAS unit is already “overloaded” with models
    - Poor delivery system
      - ALPS functional 1 in 3 years, local IT workload
  - Barrier Jet Analysis
    - Only helpful if you can forecast it
  - Atmospheric Rivers
    - Information is already integrated into QPF analysis
  - Data assimilation
    - Impacts appear to “wash-out” very quickly
  - HAS Unit
    - Insulted by efforts to secure funding (e.g. “2 in 16…”)

CNRFC Assessment

- Snow Level “Observations”
  - “Break-through” technology
  - Straightforward application to existing hydrologic modeling system.
  - Excellent efforts to deploy technology across California through DWR

CNRFC Assessment

- Soil Moisture Observations
  - Data Assimilation (DA, update model states) for existing watershed models does not exist
    - Need lots of data and clever updating techniques
    - This is a gap…
  - We already *model* soil moisture
  - Observations need to inform us of something we don't already know to be useful
  - Need to understand that these data collection efforts will not yield measurable results (in terms of existing CNRFC products/ services) for some time
    - Potential contribution to new IWRSS products/services

CNRFC Assessment Summary

- HMT West team has worked very hard and invested a great deal of energy and resources, however…
  - We've learned a lot, but some of it should have been obvious
  - The HMT R2O model is not working as envisioned
  - Near-term benefits of HMT-West have been "over-sold"
    - Sometimes to our closest partners, which puts us in an awkward position
  - Relationship with CNRFC has been heavily taxed

- What's needed…
  - A focus on prognosis rather than analysis
  - Re-scope common ground between HMT-West and CNRFC near term goals and our capacity to effectively collaborate

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Questions?

Comments?

Discussion?